

What is claimed is:

1. A method for removing material from a surface of a semiconductor wafer with a chemical mechanical polishing (CMP) process, comprising:
 - a. providing a semiconductor wafer having a top surface and a substantially flat bottom surface, the top surface substantially parallel the bottom surface;
 - b. providing a CMP apparatus including a polishing pad, the polishing pad having a polishing surface and a backing surface, the backing surface attaching to a platen, the polishing surface having a patterned portion and a un-patterned portion, the patterned portion having regularly spaced flow channels formed therein, the un-patterned portion free of flow channels;
 - c. providing a process recipe for polishing a semiconductor wafer based on a topographic information of the top surface, the recipe including directing a portion of the semiconductor wafer to reside in the channel-free portion of the polishing pad during a portion of the process;
 - e. commencing the CMP process based on the process recipe; and
 - f. terminating the CMP process when a predetermined amount of material is removed from the top surface of the semiconductor wafer.
2. The method of claim 1, in which the flow channels in the patterned portion form concentric rings uniformly spaced radially.
3. The method of claim 1, in which the flow channels in the patterned portion form concentric rings spaced increasingly densely from a central portion of the polishing surface outwardly to a peripheral portion of the polishing surface.
4. The method of claim 1, in which the patterned portion having concentric rings spaced decreasingly densely from a intermediate portion of the polishing surface towards a central portion and a peripheral portion of the polishing surface.
5. The method of claim 1, in which the un-patterned portion of the polishing surface forms an arc.

6. The method of claim 5, in which the polishing surface comprises a plurality of the circular bands.

7. The method of claim 6, in which the concentration of the plurality of the circular bands is higher in the middle portion of the polishing surface than in the central and the peripheral portions of the polishing surface.

8. The method of claim 6, in which the concentration of the plurality of the circular bands is lower in the middle portion of the polishing surface than in the central and the peripheral portions of the polishing surface.

9. A system for removing material from a surface of a semiconductor wafer, comprising

- a. a chemical mechanical polisher;
- b. a measuring means for measuring a topography of a semiconductor wafer surface;
- c. an inputting means for inputting wafer information including the nature and the amount of the material to be removed, the topographic measurement of the semiconductor wafer surface, and the chemical mechanical polisher information including a pattern information of a polishing surface of a polishing pad, the pattern information including location of a pattern of flow channels on of the polishing surface and location of a portion of the polishing surface free of flow channels;
- d. a storing means for storing information of step c; and
- e. a recipe generator for generating a recipe including parameter of resident time of a portion of the semiconductor wafer in the channeled portion of the polishing surface and the resident time of a portion of the semiconductor wafer in the channel-free portion of the polishing surface, based on the information stored in the storing means in step d.

10. The system of claim 9, in which the inputting means, the storing means, and the recipe generator are parts of a computer system.

11. The method of claim 1, in which the flow channel is one continuous spiral.

12. The method of claim 11, in which the lines of the spiral are spaced more sparsely at the center of the polishing pad.

13. The method of claim 11, in which the lines of the spiral are spaced more sparsely at the midpoint between the center and the edge of the polishing pad.